The beta-transformation: a case study for chaos based cryptography

ABSTRACT

In this paper we study characteristics of the beta-transformation and its suitability as a candidate for implementation as a symmetric cryptosystem. For ϐ > 1 the betatransformation is given by fϐ (x) = ϐx(mod1) and x ∈ [0, 1]. It is well known that its Lyapunov exponent is ∂ = logϐ. Since ∂ > 0 it ensures that the beta-transformation is a non-linear chaotic system. Finally, we will also attempt to build a discrete version of the beta-transformation.

Keyword: Beta transform; Chaos cryptography